CLAIMS

1. A surgical device, comprising:

a handle configured to be gripped;

a cannula connected to the handle; and

a sealing member disposed in an interior of the handle and configured to form a gas tight seal with an instrument disposed in an opening of the sealing member, the sealing member comprising:

a seal ring connected to the interior of the handle; and

a conical section configured to have the instrument disposed therein, the conical section being connected to the seal ring and having a height at least as large as a diameter of a base of the conical section before disposing the instrument therein.

2. The surgical device according to claim 2, wherein the conical section comprises an elastic material.

3. The surgical device according to claim 2, wherein the elastic material comprises one of silicone rubber and latex.

4. The surgical device according to claim 1, wherein the conical section comprises a first portion having a first diameter disposed adjacent the seal ring and a second portion having a second diameter less than the first diameter disposed opposite the first portion, and wherein the height of the conical section is at least as large as the first diameter before disposing the instrument in the conical seal.

5. The surgical device according to claim 4, wherein the height of the conical section is larger than the first diameter before disposing the instrument in the conical section.

6. The surgical device according to claim 1, wherein the height of the conical section is larger than the diameter of the base of the conical section before disposing the instrument in the conical section.

7. The surgical device according to claim 6, wherein the conical section comprises a first portion having a first diameter adjacent the seal ring and a second portion having a second diameter less than the first diameter opposite the first portion, and wherein the height of the conical section is larger than the first diameter before disposing the instrument in the conical section.

8. The surgical device according to claim 7, wherein the conical section is configured to be everted when the instrument is moved in an axial direction.

9. The surgical device according to claim 1, further comprising:

an instrument removably disposed in the conical section, the conical section forming the gas tight seal with the instrument.

10. The surgical device according to claim 9, wherein the instrument comprises a penetrator.

11. A surgical device, comprising:

a handle configured to be gripped;

a cannula connected to the handle; and

a sealing member disposed in an interior of the handle and configured to form a gas tight seal with an instrument disposed in an opening of the sealing member, the sealing member comprising:

a seal ring connected to the interior of the handle;

a conical section configured to have the instrument disposed therein, the conical section connected to the seal ring; and

first and second elastic protrusions connected to said conical section and configured to have the instrument disposed therein, the elastic protrusions configured to contact one another to form the gas tight seal.

12. The surgical device according to claim 11, wherein one of the conical section and the protrusions comprises an elastic material.

13. The surgical device according to claim 12, wherein the elastic material comprises one of silicone rubber and latex.

14. The surgical device according to claim 11, wherein the first and second protrusions comprise flaps.

15. The surgical device according to claim 14, wherein the flaps are stretched and connected to an interior of one of the cannula and the handle, such that the flaps are urged toward one another.

16. The surgical device according to claim 11, wherein the first and second protrusions comprises flat flaps configured to form the gas tight seal with the instrument when the instrument is disposed in the sealing member and configured to form the gas tight seal with one another when an instrument is not disposed in the sealing member.

17. The surgical device according to claim 11, wherein the sealing member comprises a neck disposed between the conical section and the protrusions, the neck configured to form the gas tight seal with the instrument disposed in the sealing member.

18. The surgical device according to claim 17, wherein the neck is configured to form the gas tight seal with the instrument having a diameter of between about 3 mm and about 12 mm disposed in the sealing member.

19. The surgical device according to claim 17, wherein the conical section comprises a first portion having a first diameter disposed adjacent the seal ring and a second portion having a second diameter less than the first diameter disposed adjacent the neck.

20. The surgical device according to claim 11, wherein the protrusions define voids, and one of the cannula and the handle comprises attachment portion connecting with the voids of the protrusions.

21. The surgical device according to claim 11, further comprising:

an instrument removably disposed in the sealing member.

22. The surgical device according to claim 21, wherein the instrument comprises a penetrator.

23. A sealing member configured to form a gas tight seal with an instrument removably disposed in a surgical device, the sealing member comprising:

a seal ring configured to be connected to the interior of the surgical device; and

a conical section connected to the seal ring and having a height at least as large as a diameter of a base of the conical section before the instrument is disposed in the seal.

24. The sealing member according to claim 23, wherein the conical section comprises an elastic material.

25. The sealing member according to claim 24, wherein the elastic material comprises one of silicone rubber and latex.

26. The sealing member according to claim 23, wherein the conical section comprises a first portion having a first diameter disposed adjacent the seal ring and a second portion having a second diameter less than the first diameter disposed opposite

the first portion, and wherein the height of the conical section is at least as large as the first diameter before the instrument is disposed in the conical section.

27. The sealing member according to claim 26, wherein the height of the conical section is larger than the first diameter before the instrument is disposed in the conical section.

28. The sealing member according to claim 23, wherein the height of the conical section is larger than the diameter of the base of the conical section before the instrument is disposed in the conical section.

29. The sealing member according to claim 28, wherein the conical section comprises a first portion having a first diameter adjacent the seal ring and a second portion having a second diameter less than the first diameter disposed opposite the first portion, and wherein the height of the conical section is larger than the first diameter before the instrument is disposed in the conical section.

30. A sealing member configured to form a gas tight seal with an instrument removably disposed in a surgical device, the seal comprising:

a seal ring configured to be connected to an interior of the surgical device;

a conical section connected to the seal ring; and

first and second elastic protrusions configured to contact one another to form the gas tight seal.

31. The sealing member according to claim 30, wherein one of the conical section and the protrusions comprises an elastic material.

32. The sealing member according to claim 31, wherein the elastic material comprises one of silicone rubber and latex.

33. The sealing member according to claim 30, wherein the first and second protrusions comprise flaps.

34. The sealing member according to claim 33, wherein the flaps are configured to be urged toward one another when stretched.

35. The sealing member according to claim 30, wherein the first and second protrusions comprises flat flaps configured to form the gas tight seal with the instrument when the instrument is disposed in the seal and configured to form the gas tight seal with one another when an instrument is not disposed in the seal.

36. The sealing member according to claim 35, further comprising:

a neck disposed between the conical section and the protrusions, the neck configured to form the gas tight seal with the instrument disposed in the seal.

37. The sealing member according to claim 36, wherein the neck is configured to form the gas tight seal with the instrument having a diameter of between about 3 mm and about 12 mm disposed in the seal.

38. The sealing member according to claim 37, wherein the conical section comprises a first portion having a first diameter disposed adjacent the seal ring and a second portion having a second diameter less than the first diameter disposed adjacent the neck.

39. The sealing member according to claim 30, wherein the protrusions define voids configured to connect with attachment portions of the surgical device.

40. A surgical device, comprising:

a handle configured to be gripped;

a cannula connected to the handle; and

means for forming a gas tight seal between an instrument removably disposed therein, the means for forming the gas tight seal having a height at least as large as a diameter of a base of the means for forming the gas tight seal before disposing the instrument therein.

41. A surgical device, comprising:

a handle configured to be gripped;

a cannula connected to the handle; and

means for forming a gas tight seal between an instrument removably disposed therein and for forming the gas tight seal between portions of the means for forming the gas tight seal when no instrument is disposed therein.

42. A method of sealing a surgical device, comprising:

forming a seal between an instrument and a sealing member, the sealing member having a height at least as large as a diameter of a base of the seal when the instrument is not disposed in the seal.

43. The method according to claim 42, further comprising:

disposing the sealing member in a handle of a trocar.

44. The method according to claim 42, wherein the instrument comprises a penetrator.

45. A method of sealing a surgical device, comprising:

disposing an instrument in a conical member; and

forming a seal between protrusions connected to the conical member and the instrument.

46. The method according to claim 45, wherein the protrusions comprises flaps.

47. The method according to claim 46, further comprising:

disposing the conical member and the protrusions in a handle of a trocar.

48. The method according to claim 46, wherein the instrument comprises a penetrator.

49. A method of sealing a surgical device, comprising:

disposing a sealing member in an interior of a handle; and

forming a gas tight seal with an instrument disposed in an opening of the sealing member, the sealing member comprising a seal ring connected to the interior of the handle, and a conical section configured to have the instrument disposed therein, the conical section connected to the seal ring and having a height at least as large as a diameter of a base of the conical section before disposing the instrument therein.

50. A method of sealing a surgical device, comprising:

disposing a sealing member in an interior of a handle; and

forming a gas tight seal with an instrument disposed in an opening of the sealing member, the sealing member comprising a seal ring connected to the interior of the handle, a conical section configured to have the instrument disposed therein, the conical section connected to the seal ring, and first and second elastic protrusions configured to have the instrument disposed therein, the elastic protrusions configured to contact one another to form the gas tight seal.

51. A surgical device, comprising:

a handle configured to be gripped;

a cannula connected to the handle; and

a sealing member disposed in an interior of the handle and configured to form a gas tight seal with an instrument disposed in an opening of the sealing member, the sealing member comprising:

a seal ring connected to the interior of the handle;

a first section connected to the seal ring; and

a second section connected to the first section and configured to have the instrument disposed therein.

52. The surgical device according to claim 51, wherein the first section comprises a bellows.

53. The surgical device according to claim 51, wherein the first section comprises a pleated section.

54. The surgical device according to claim 51, wherein the first section is configured to be extended along an axis of the sealing member.

55. The surgical device according to claim 51, wherein at least one of the first section and the second section comprises an elastic material.

56. The surgical device according to claim 55, wherein the elastic material comprises one of silicone rubber and latex.

57. The surgical device according to claim 51, further comprising:

an instrument removably disposed in the second section, the second section forming the gas tight seal with the instrument.

58. The surgical device according to claim 57, wherein the instrument comprises a penetrator.

59. The surgical device according to claim 51, further comprising:

a valve configured to form a gas tight seal when no instrument is disposed therein.

60. The surgical device according to claim 59, wherein the valve is configured to permit gas flow therethrough when the instrument is disposed therein.

61. The surgical device according to claim 59, wherein the valve comprises a one way valve.

62. The surgical device according to claim 59, wherein the valve comprises first and second protrusions configured to maintain the gas tight seal.

63. The surgical device according to claim 62, wherein the valve comprises a first cylindrical portion connected to the first and second protrusions.

64. A sealing assembly configured to form a gas tight seal with an instrument removably disposed in a device, the sealing assembly comprising:

a seal ring configured to be connected to an interior of the device;

a first section connected to the seal ring; and

a second section connected to the first section, the second section having an opening formed therein and being configured to permit the instrument to be disposed therethrough.

65. The sealing assembly according to claim 64, wherein the first section comprises a bellows.

66. The sealing assembly according to claim 64, wherein the first section comprises a pleated section.

67. The sealing assembly according to claim 64, wherein the first section is configured to be extended along an axis of the sealing member.

68. The sealing assembly according to claim 64, wherein at least one of the first section and the second section comprises an elastic material.

69. The sealing assembly according to claim 68, wherein the elastic material comprises one of silicone rubber and latex.

70. The sealing assembly according to claim 64, further comprising:

a valve configured to form a gas tight seal when no instrument is disposed therein.

71. The sealing assembly according to claim 70, wherein the valve is configured to permit gas flow therethrough when the instrument is disposed therein.

72. The sealing assembly according to claim 70, wherein the valve comprises a one way valve.

73. The sealing assembly according to claim 70, wherein the valve comprises first and second protrusions configured to maintain the gas tight seal.

74. The sealing assembly according to claim 73, wherein the valve comprises a first cylindrical portion connected to the first and second protrusions.

75. A method of sealing a device, comprising:

disposing a sealing member in an interior of the device, the sealing member having an opening therein and being configured to form a gas tight seal with an instrument disposed in the opening of the sealing member, the sealing member comprising a seal ring connected to the interior of the handle, a first section connected to the seal ring, and a second section connected to the first section and configured to have the instrument disposed therein.

76. The method according to claim 76, further comprising:

disposing a one way valve in an interior of the device, the valve configured to achieve a gas tight seal when no instrument is disposed in the valve.